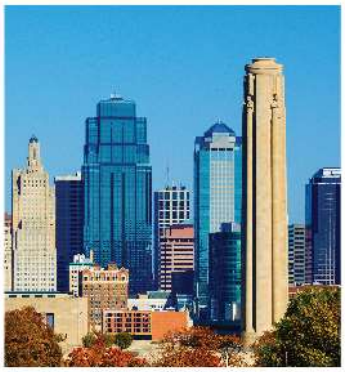
OFFICE OF THE CITY AUDITOR

PEFORMANCE AUDIT

April 2018

Preserve and Restore Park Ecology with Sustainable Maintenance Approach

2018
Environmental Achievement Award
Kansas City Environmental Management Commission



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April 30, 2018

Honorable Mayor and Members of the City Council, and Members of the Board of Parks and Recreation Commissioners:

This audit assesses the Parks and Recreation Department's incorporation of environmentally sustainable practices in parkland maintenance activities. We determined that the department has pockets of sustainable practices, but needs to strategically approach park landscape maintenance with a goal of preserving and restoring park ecology.

Our parks' greatest natural resource is its local ecology of plants, air, water, soil, and animals. Sustainable maintenance practices take into consideration the health and reproductive capacity of an area's native local ecology. The department's Conservation Corps and Forestry Operations follow some sustainable practices including the protection and planting of native plant species and pest management activities like the removal of invasive species.

Beyond these pockets of sustainability, the department's park landscape maintenance activity largely focuses on park aesthetics in the form of ornamental annual flowers and turfgrass. The department's total mowing acreage of turfgrass has increased over the past five years and non-native annual flowers are installed in most flowerbeds throughout the city. We found that the department does not incorporate sustainable practices into many of the activities required to maintain these landscape features including watering, fertilizer and pesticide use, and mowing activities. Additionally, we found the department does not follow its established policies related to pesticide application.

The department needs a strategic approach to environmentally sustainable maintenance. Starting from the department's business plan goals down to day-to-day maintenance activities, the department does not have measurable goals to guide the organization's sustainable management of parkland. Most parkland does not have an environmental resource management plan to provide staff and contractors strategic direction in the sustainable maintenance unique to a park or type of park. Additionally, the operations and maintenance manual's procedures and practices that direct park district staff in daily parkland maintenance activities do not incorporate sustainability.

The Parks and Recreation Department physically touches and interacts with the environment in ways other departments do not. The department's goals, policies, procedures, and practices should lead the effort to preserve, protect, and restore our community's natural resources. We

make recommendations to strengthen the department's sustainable maintenance of parkland natural resources. Impacts from implementing our recommendations include ecological benefits such as air and water filtering, climate regulation, pollination, and human health that can have a significant economic value as well as potential reduced maintenance costs or the ability to reallocate maintenance resources. A growing body of research suggests that natural elements within cities can protect and improve a community's resiliency and quality of life.

The draft report was sent to the director of Parks and Recreation on March 29, 2018, for review and comment. His response is appended. We would like to thank the staff in the Parks and Recreation Department, KC Wildlands, and Bridging the Gap for their assistance and cooperation during this audit. The audit team for this project was Sue Polys and Jonathan Lecuyer.

Douglas Jones
City Auditor

Preserve and Restore Parks Ecology with Sustainable Maintenance Approach

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Introduction

Objectives

We conducted this audit of the Parks and Recreation Department's use of sustainable practices to manage parkland natural resources under the authority of Article II, Section 216 of the Charter of Kansas City, Missouri, which establishes the Office of the City Auditor and outlines the city auditor's primary duties.

A performance audit provides "findings or conclusions based on an evaluation of sufficient, appropriate evidence against criteria. Performance audits provide objective analysis to assist management and those charged with governance and oversight in using the information to improve program performance and operations, reduce costs, facilitate decision making by parties with responsibility to oversee or initiate corrective action, and contribute to public accountability."[1]

This report is designed to answer the following question:

- Does the Parks and Recreation Department maximize the use of environmentally sustainable practices to manage and maintain natural resources?

Scope and Methodology

Our review focuses on sustainable practices in the care and maintenance of parkland vegetation. Our audit methods included:

- Interviewing Parks and Recreation staff to determine practices used in the maintenance of parkland.
- Interviewing Parks and Recreation outside partners to determine practices used in the maintenance of parkland and to identify recommended practices.

[1] Comptroller General of the United States, *Government Auditing Standards* (Washington, DC: U.S. Government Printing Office, 2011), p. 17.

- Reviewing laws and regulations to identify compliance risks related to the sustainable maintenance of parkland.

- Reviewing the Parks and Recreation Department's adopted policies, plans, manuals, and contracts to identify practices used in the maintenance of parkland.

- Reviewing literature and other cities' environmental resource plans, and policies and procedures to identify recommended practices in the sustainable maintenance of parkland.

- Comparing Parks and Recreation practices, policies, procedures, and manuals to identified recommended sustainable parkland maintenance practices to assess the Parks and Recreation Department's use of recommended practices.

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. No information was omitted from this report because it was deemed privileged or confidential.

Background

Parkland Ecology

The scope of this audit is focused on parkland ecology. Parkland ecology refers to the distribution and abundance of organisms, the interaction among organisms, and the interactions between organisms and their environment. Sustainable maintenance of parkland ecology refers to the conservation and restoration of natural resources diversity, health, and reproductive capacity. The ecology of a park is part of its natural resources and the department's maintenance of those resources impacts plants, air, water, and soil in the area.

Kansas City's Park System

The Parks and Recreation Department manages Kansas City's park system. The park system includes over 12,000 acres of parkland that encompass 221 parks, 135 miles of parkways and boulevards,

48 fountains, 122 monuments, a zoo, a national memorial, amphitheaters, and recreational facilities. The department houses the Natural Resource Management Division.

Natural Resource Management Division

The Natural Resource Management Division maintains the natural resources as well as the built environment that supports the natural experience such as playgrounds, shelters, and ball fields but excludes facilities (community centers, museums, etc.). The division is also responsible for mowing turfgrass and maintaining city trees in the right-of-way.

Division staff and contractors maintain approximately 4,000 acres of parkland. These acres include lakes and waterways, golf courses, natural areas, athletic fields, and general park areas.

The Natural Resource Management Division is made up of the park maintenance section, the Forestry Operations section, the Greenhouse and Landscape section, and the Conservation Corps.

Park Maintenance Section - includes the North, Central, and South District. Park maintenance staff in these districts are responsible for aspects of both biological and physical maintenance of parkland. Biological maintenance responsibilities cover everything outside of small landscape beds and tree care, including, for example, turfgrass areas, athletic fields, and large shrubs and bushes.

Forestry Operations Section (Forestry) - responsible for overseeing the urban forest located within parks and public rights-of-way.

Greenhouse and Landscape Section - responsible for development and maintenance of approximately 108 flowerbeds throughout the city.

Conservation Corps - responsible for the development and maintenance of designated natural areas and various native plantings throughout the city.

Findings and Recommendations

Additional Sustainable Maintenance Practices Needed

The Parks and Recreation Department has pockets of sustainable maintenance practices, but overall needs to incorporate additional sustainable maintenance practices that address plant stewardship, air quality, water conservation, and pesticide and fertilizer use.

Department Should Expand Existing Sustainable Plant Practices

The Parks and Recreation Department has established some sustainable plant practices. These practices are largely focused in the Conservation Corps and some Forestry Operations. The department's practices for mowing, flowerbed, and tree planting and maintenance do not maximize the use of sustainable practices.

Parks and Recreation has some environmentally sustainable plant practices. Recommended sustainable practices for plant stewardship should conserve or install diverse plants that are appropriate to the sites' conditions and climate, or are native to the region.

Plant Stewardship Strategies

Examples of strategies to achieve sustainable maintenance practices for plant stewardship include:

- Establishing lists of native and appropriate plants.
- Developing preferred plant species selection criteria.
- Following horticulture standards.
- Establishing a process for healthy and diseased plant material management.

Source: *SITES v2 Rating System.*[2]

We identified sustainable plant stewardship practices used by the Conservation Corps and the Forestry Operations Section. The

[2] The SITES v2 Rating Systems is owned by Green Business Certification Inc. (204). The material on which the SITES v2 Rating system is based was developed through a collaborative, interdisciplinary effort of the American Society of Landscape Architects Fund, The Lady Bird Johnson Wildflower Center at The University of Texas at Austin, and the United States Botanic Garden.

Conservation Corps, with the help of outside partners, has established lists of native and appropriate species for plantings. Staff use species lists to plant and maintain approximately 17 rain gardens, 6 pollinator gardens, and the 3 designated Natural Areas[3]. Conservation Corps staff also described the criteria they use to select the plants to install.

The Forestry Operations Section reports using ANSI A300[4] standards for planting and maintaining healthy trees in parklands and rights-of-way. The department has written requirements for contracted tree planting, maintenance, and care. Forestry has established lists and diversity requirements for trees approved to plant.

Sustainable plant stewardship practices help the local ecology perform beneficial functions for residents by removing carbon from the air, improving habitat functions, preventing erosion, cleaning the air and water, regulating temperatures, and improving people's overall health and well-being. These practices also may reduce the amount of resources required to maintain parkland.

Some department landscape maintenance activities do not incorporate sustainable plant practices. The department's turfgrass and flowerbed care do not incorporate native or regionally appropriate plantings. The department's tree planting and care are not done based on the tree's health.

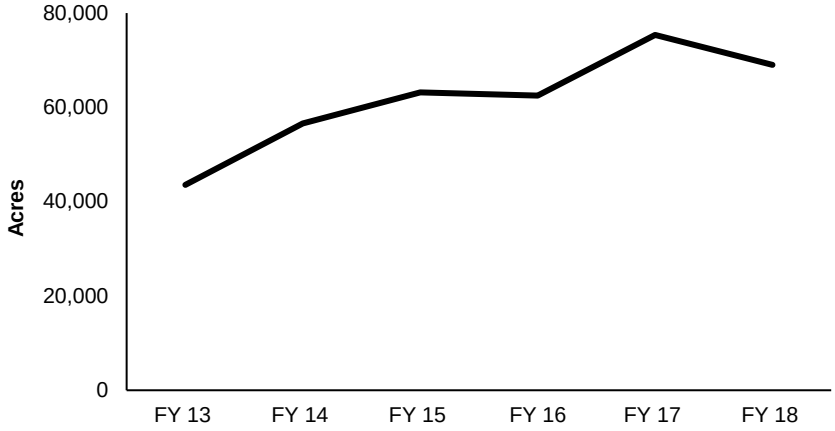
Turfgrass. Parks maintenance districts focus a large portion of their vegetation maintenance on mowing turfgrass. Turfgrass does not support local ecologies and its maintenance does not align with sustainable practices. Turfgrasses do not provide space for other plant or animal species. Mowing turf produces pollutants and in some cases maintaining turfgrasses requires chemicals and fertilizers.

The department's mowing acreage has increased over the past five years. Approximately 70,000 acres of parks and boulevards are mowed annually. (See Exhibit 1.) Staff attributes increases in total acres mowed annually to additional mowing cycles of existing acreage and adding new areas for staff to mow.

[3] The department's designated Natural Areas include Rocky Point Glade, Jerry Smith Natural Area, and Hidden Valley Natural Area.

[4] ANSI A300 are tree care industry standards that describe pruning, soil management, planting, transplanting, root management, and other types of tree care strategies.

Exhibit 1. Acres Mowed by Fiscal Year



Source: CAO Calculations, Adopted KCMO City Budgets.

Reduced mowing is a strategy used by other parks departments to improve plant stewardship. Management reported that past efforts to reduce mowing cycles and acreage were met with complaints related to the look of parks and the perceived inequitable distribution of reduced mow areas. Other parks departments reduced their mowing cycles and acreage by adopting strategies to mitigate complaints including replacing turfgrasses with native grasses and plants while maintaining a buffer area of turfgrass to make the native area a clearly intentional habitat patch; and providing signage and education to help residents understand the value and intent of the habitat patches. Although a reduction in mowing may not provide immediate cost savings, it is sustainable and may provide the ability to reallocate resources away from mowing over time. Long-term reductions in mowing costs combined with the ecological benefits offset and recoup the initial increased investment.

Flowerbeds. Parks Greenhouse and Landscape section staff primarily plant and maintain annuals. There are approximately 108 flowerbeds in the city with at least 80 of these planted as annuals by greenhouse staff. Care and maintenance of roughly 30 perennial beds is split between a Conservation Corps staff member and Greenhouse and Landscape staff. Perennial beds are not necessarily planted with native species.

Annuals vs. Perennials vs. Native Species

Annual flower species are plants that only grow for one season. Flowers must grow from seed each season. The benefit of an annual is that they typically bloom throughout the season.

Perennial flower species are plants that grow back each year from roots that go dormant in the soil in the winter. Perennials are generally less work to maintain compared to an annual.

Native species are plants that have occurred naturally in a particular region, ecosystem, or habitat without human introduction. Native plants are adapted to and thrive in the soils, moisture, and weather of a region. Native plants have formed symbiotic relationships with native wildlife over thousands of years and therefore offer the most sustainable habitat.

Although staff believe citizens expect annuals, planting non-native annuals contradicts sustainable practices. Typically, non-native, annual species require additional resources and care beyond what native or ecologically appropriate plant species require. Annual flowers are purchased each year, cultivated in a greenhouse, planted in mass throughout the city, and continuously watered. Using native or regionally appropriate perennials would reduce these activities and provide habitats for pollinators important to the environment and potentially reduce maintenance costs.

Trees. The Forestry Operations section staff reports that they do not plant, prune, or remove city trees systematically. Regularly pruning trees is a recommended sustainable maintenance practice. The department does not have a systematic plan for pruning trees. Pruning and tree removal is based on citizen complaints. The department estimates they annually prune less than ten percent of trees that should be pruned. Without regular pruning, the department cannot manage tree health, structure, and risks from storm damage.

The department's tree plantings are insufficient to replace the city's urban tree canopy lost to tree removal. The urban tree canopy is the combined canopy coverage of all trees in the city. The department has planted fewer trees than they removed between fiscal year 2015 to 2017. Most trees planted by the department in this period are small seedlings.[5] The city forester stated that to replace the canopy of a healthy, full grown tree, five newly planted juvenile nursery trees must grow for five years. A smaller tree

[5] A seedling is a tree seed that has sprouted several inches. A nursery bought tree is a juvenile tree that is several feet tall with an established root ball.

canopy results in residents receiving less of the benefits provided by the tree canopy such as cooling surrounding air, removing pollution from the air, and reducing soil erosion from established root systems.

To improve the sustainable maintenance practices in parkland, the director of parks and recreation should reduce mowing and replace turfgrasses with native plants when possible, shift flowerbeds to native or regionally appropriate perennial beds, and systematically plant and prune city trees.

Incorporating Additional Practices May Reduce Air Quality Impact from Landscape Maintenance

The Natural Resource Management Division has some practices to limit the impacts landscape maintenance has on air quality, but has opportunities for improvement. Recommended sustainable maintenance practices for air quality should reduce pollution by minimizing the use of powered landscape maintenance equipment that exposes site users to air pollutants and generates greenhouse gases.

Air Quality Stewardship

Examples of strategies to achieve sustainable maintenance practices for air quality include:

- Scheduling maintenance activity during low site usage times.
- Using low emissions emitting equipment and specifying a targeted reduction in emissions by maintenance activity.
- Incorporating the use of manual or electrical powered equipment.
- Designing the parkland to minimize requirements for gasoline-powered maintenance equipment.
- Selecting plants that require minimal maintenance or can be maintained with hand tools.
- Selecting equipment that minimizes emissions of air pollutants and meets or exceeds U.S. EPA standards. Focus on reducing the use of 2-stroke engine equipment.
- Converting turfgrass areas to ground cover or shrubs in areas that adjoin walks and curbs. Large lawn areas can be converted to meadows or naturalized into restored habitats.

Source: *SITES v2 Rating System.*

On Ozone Action alert days[6], Parks and Recreation staff and contractors do not use gas powered machinery and limit emissions

[6] Ozone alerts are determined and announced by the Mid-America Regional Council.

producing activities in accordance with the department's Ozone Action Plan. The Ozone Action Plan provides staff and contractors direction and procedures to follow when alert days occur so that factors harming the ozone can be limited. The Ozone Action Plan is the only strategy used by the department in maintenance activities that helps limit the amount of pollutants in the air that can be dangerous to human health and contribute to greenhouse gases that cause climate change.

To maximize sustainable air quality practices, the director of parks and recreation should adopt additional practices to limit the use of powered landscape maintenance equipment that exposes site users to local air pollutants and generates greenhouse gases.

Water Conservation Practices Could Be Adopted

The Natural Resource Management Division does not employ water conservation practices for landscape beds. Recommended practices for sustainable maintenance include minimizing water use for landscape irrigation.[7]

Water Conservation Strategies

Examples of strategies to achieve sustainable maintenance practices for water conservation include:

- Reducing or eliminating the use of potable water, natural surface water, and groundwater withdrawals for landscape irrigation beyond a plant's establishment period.
- Installing water meters to record and measure water usage to compare to an established baseline.
- Using the U.S. EPA WaterSense Water Budget Tool to identify the baseline case and water savings.
- Reducing water usage by at least 50 percent from the baseline case beyond the establishment period for plants.
- Reusing graywater, captured rainwater, HVAC blowdown, or condensate.
- Using efficient water systems like drip irrigation.
- Designing the landscape to be self-sustaining and not requiring permanent irrigation or watering.

Source: *SITES v2 Rating System.*

The Parks and Recreation Department does not water most parkland. While the department waters newly planted trees,

[7] Athletic fields, non-commercial food garden production, and regulations for fire prone areas are generally exempted from these recommended practices.

watering is discontinued after an establishment period in accordance with sustainable maintenance practices. This practice minimizes the use of water.

Contractors and staff water landscaped beds throughout the Spring, Summer, and Fall. Most flowerbeds are not native perennials and require ongoing water to survive. Staff and contractors fill watering trucks from fire hydrants and spray water from the trucks to water flowerbeds. Staff do not track water usage over time and thus do not know the baseline quantity of water to maintain flowerbeds city wide. Without water conservation practices, the department may use water it otherwise would not.

To maximize sustainable maintenance practices of park landscape, the director of parks and recreation should adopt water conservation practices to track the amount of water applied annually for parkland maintenance and minimize the overall application of water for landscape irrigation after plant establishment periods.

Additional Sustainable Pesticide Practices Needed

The Parks and Recreation Department has some practices to guide staff in the use of pesticides, however, these do not focus on minimizing the use of synthetic pesticides. Staff are not consistently following the department or city's adopted policies and procedures related to the use of pesticides.

The department has some sustainable pesticide practices, but additional practices could be incorporated. Recommended sustainable practices for pesticide use include observation and planning to minimize or eliminate synthetic pesticides.[8]

[8] Synthetic pesticides are manmade chemical compounds. Non-synthetic pesticides occur in nature, although this does not mean they are not toxic.

Sustainable Pesticide Strategies

Examples of strategies to achieve sustainable maintenance practices for pesticide use include:

- Developing non-toxic maintenance measures for ecologically sensitive areas and human use areas.
- Setting and enforcing buffer zones where pesticides may not be applied.
- Establishing action thresholds that define pest population levels and approved management strategies for pesticide use.
- Requiring prior notification to all site users and to the public when chemical pesticides will be applied.
- Creating a list of herbicides, insecticides, and fungicides approved for use when physical, mechanical, and biotic control methods for pests have been ineffective. Specify chemicals that are the least toxic.

More environmentally stringent policies include:

- Banning the use of all pesticides for cosmetic purposes.
- Banning the use of pesticides prior to the appearance of weed or pests (pre-emergent herbicides).

Source: *SITES v2 Rating System.*

Pesticides are used in most programs in the Natural Resource Management Division. Staff and contractors use synthetic pesticides in natural areas, turfgrass areas, greenhouses, and flower beds. While the department may employ alternative, non-toxic strategies at times (for example, hand removal of weeds in beds), these are not required. The department's use of pesticides, including pre-emergent herbicides, on turfgrass is based on routine schedules and not action thresholds. Staff's application of pesticides in natural areas and flower beds is based on their discretion. Parks does not require staff to consider non-toxic or least toxic methods first and does not provide staff approved pesticide lists or action thresholds for use.

Without action thresholds, non-toxic alternatives, observation, and planning, staff may use pesticides beyond the minimum, least impactful required to abate pests. Pesticides are toxic to the environment, stress plants, and can have negative effects on human and wildlife health. Using pesticides for cosmetic purposes increases the overall amount of environmental exposure to pesticides. Without clearly identified buffer zones, staff may apply pesticides near areas sensitive to the impacts of pesticides such as dog parks, playgrounds, and areas prone to water runoff.

To reduce stress on plants, decrease negative effects on resident and animal health, and have the lowest possible negative ecological and environmental impacts, the director of parks and recreation should develop additional practices to minimize or eliminate the use of synthetic pesticides in parks.

Natural Resource Management Division staff are not consistently following adopted pesticide policies and procedures. The city's Environmental Management Systems Manual and Parks and Recreation Department operations and maintenance manual require staff applying pesticides to follow certain licensing, training, documentation, storage, disposal, and use requirements. Many of these policies align with recommended maintenance practices, but the division is not following all of them.

Our review of the division's use of pesticides found:

- Not all maintenance groups have someone licensed to supervise pesticide activity.
- Staff does not have licensing for forestry and right-of-way pesticide applications that they undertake.[9]
- Not all staff using pesticides maintain required spray logs and some staff are not maintaining all required information on their spray log.

Without following adopted policies and procedures on the use of pesticides, the health and safety of staff, the public, and the environment is potentially adversely impacted.

To protect the health and safety of staff, the public, animals, and the environment, the director of parks and recreation should ensure staff adhere to the department's and city's adopted pesticide policies and procedures.

Additional Sustainable Fertilizer Practices Needed

The Natural Resource Management Division's fertilizer practices do not maximize sustainable practices. Recommended soil maintenance practices minimize the use and impacts of inputs like fertilizers through observation and planning.

[9] The list of chemicals used by the department provided to us during our review did not contain any restricted use chemicals and thus, staff are not required by law to have licensing for the use of those chemicals, however, city policy requires an employee with appropriate licensing to supervise the use of chemicals to ensure chemicals are properly used and handled.

Sustainable Fertilizer Strategies

Strategies to achieve sustainable maintenance fertilizer practices include:

- Banning the use of "weed and feed" type fertilizers.
- Using a process for identifying soil deficiencies that specify use of least harmful methods to alter the soil when necessary.
- Using a process for applying fertilizers (if needed) to ensure that application is effective and prevents harm to environmental and human health.
- Defining action thresholds and setting levels of fertilizer concentrations and frequency of application according to test results.
- Defining how much water should be applied after fertilizer applications and explaining the choices made by referring to regional climatic conditions and soil data.

More aggressive practices include:

- Developing a list of organic or slow-release fertilizer products that are approved for use on site.
- Banning the application of all fertilizers during rainy seasons, before predicted heavy rainfall events, and during summer months.
- Banning the use of all fertilizers after the establishment period, except for periodic applications of mature stable compost or other soil amendments as indicated by soil or plant tissue tests.

Source: *SITES v2 Rating System.*

The department does incorporate some recommended sustainable fertilizer practices. Landscape and Greenhouse Operations staff state that they use organic fertilizers. Fertilizers are not used in most park areas. In areas where fertilizers are used, policies direct staff to apply fertilizer only in appropriate weather conditions, though appropriate weather is not defined.

Staff and contractor's application rates and fertilizer ratios are not based on observed need in plants and turfgrasses. The department's policy prescribes a high Phosphorous fertilizer ratio in the fall and Nitrogen focused ratio in the spring and winter. Fertilizer application rates and ratios should be determined based on an assessment of the soil's composition, the needs of the plants, and the impact on the surrounding ecology.

Without proper assessment of soil needs for fertilizer applications, fertilizers may negatively affect the surrounding environment. Nitrogen is converted to nitrate through natural processes and is

harmful to humans and animals if leached into nearby water. Phosphorous can encourage algae growth in waterways and remove oxygen from water, killing fish in surrounding waterways.

To reduce the use and unintended impacts of fertilizers on plant, animal, and resident health, the director of parks and recreation should implement sustainable fertilizer observation and planning practices.

Sustainable Practices Can Be Maximized by Strategic and System Wide Approach

The Parks and Recreation Department needs sustainability more clearly defined in its strategic documents, plans, and manuals. The department's strategic business plan does not set goals for staff to sustainably maintain parkland. The lack of sustainability goals is reflected in limited environmental resource planning and few sustainable practices incorporated into the department's operation and maintenance manual. The department has many internal and external resources it can utilize to help develop environmental resource plans and adopt sustainable practices into its manuals. As the department adopts new goals, plans, and manuals, training from these documents will be important.

Parks Business Plan Needs Ecological Stewardship Goals

The Parks and Recreation Department's business plan does not incorporate sustainable maintenance goals. The National Recreation and Park Association recommends incorporating sustainability into maintenance based on an organization's goals. Part of the department's mission is to provide environmentally sound natural resource management. Environmentally sound natural resource management considers the impacts of activities on parkland ecology so that the ecology can remain healthy and reproduce itself. Environmentally sustainable maintenance goals should address impacts of maintenance activity on parkland ecology including plants, air, water, soil, and pest management.

Sustainable Maintenance Goal Examples

Preserve/Conserve Native Plant Species
- Native planting preference
- Desired coverage ratio of native species in parks
- Goals to reduce mowing cycles and acreage
- Trees and plant replacement ratio
- Percentage of invasive species removed

Air Quality
- Carbon footprint/output goals

Water
- Targets for water use, retention, or reuse

Soil Management Plan
- Fertilizer use reduction or targets
- Pesticide use reduction or targets

Floodplain and Wetlands
- Targeted condition of floodplain and riparian areas

Limited guidance is provided related to sustainability and conservation in parks. Current business plan maintenance goals in most parks relate to aesthetics and are achieved through mowing goals and tree pruning. Although the strategic business plan identifies sustainability and conservation as two principles to include in all park designs, these principles are not defined and do not contain measurable goals. The plan also states that biological maintenance practices should be observed as a maintenance standard in open and natural areas, but the plan does not define what these practices are, how to measure them, or what level of maintenance should be achieved.

Without clear sustainable maintenance goals related to parkland ecology, decisions related to sustainability are not made in a systematic, strategic fashion and staff focus primarily on aesthetics. While most staff we interviewed recognized the importance of environmental stewardship and were interested in implementing sustainable practices, their immediate job responsibilities were more focused on the aesthetic care of parks, not environmental stewardship.

Most staff saw the Conservation Corps, a small two-person section within the department, and external partners as the main source of sustainable practices within the Parks and Recreation Department. The activities and programs undertaken by these outside groups and the Conservation Corps are not addressed in the strategic plan.

Because only a small portion of staff are dedicated to environmental stewardship and their activities are not identified as a priority within the organization, many sustainable activities are undertaken at staff discretion or by the leadership of an outside group. Programs and activities that are not defined in the strategic plan are vulnerable to being provided insufficient resources or risk elimination over time.

To ensure sustainability is strategically incorporated into department maintenance activity related to natural resource management goals, the director of parks and recreation should propose goals related to native plant selection, pest and invasive species management, air quality, soil inputs, and water conservation in parkland for consideration by the Board of Parks and Recreation Commissioners.

Environmental Resource Plans Needed for all Parkland

The Parks and Recreation Department has not created environmental resource plans for most parkland. While some pest management policies are in place for parkland, the department does not have an integrated pest management strategy.

Environmental resource plans are a significant undertaking. There are, however, many outside resources to assist Parks and Recreation in the process. We reviewed the environmental resource plans of other cities to help the department identify different approaches for the development of an environmental resource plan.

Environmental resource planning and monitoring is limited. The National Recreation and Park Association and the National Parks Services recommend the development of an environmental resource plan that provides staff written guidance for the sustainable maintenance activities to undertake in a park. A plan should identify the area's local ecology, ecological succession communities[10], preferred plant species and diversities, an integrated pest management plan, and strategies to ensure healthy soil and water on site.

Less than 350 acres of the over 12,000 acres in Kansas City's parks and boulevard system are covered by an environmental resource plan. Only designated natural areas (Jerry Smith Park, Rocky Point Glade, and Hidden Valley Natural Area) and Roanoke Park have environmental resource plans that incorporate recommended practices. For example, Jerry Smith Park's environmental resource

[10] Ecological succession is the process of predictable change of an ecological community over time. Understanding the ecological succession communities present helps determine sustainable conservation and restoration strategies.

plan includes local ecology, pest management strategies, ecological goals, and other recommended practices. (See Exhibit 2.)

Exhibit 2. Jerry Smith and Saegar Woods Environmental Resource Plan (Excerpts)

Site Description: Jerry Smith Park (owned by the KCMO Parks and Recreation Department) is a 360-acre tract of land adjoined by the 20-acre Saeger Woods Conservation Area (owned by the Missouri Department of Conservation). One third of Jerry Smith Park is remnant prairie. Saegar contains only small areas of prairie with the remainder woods.

Ecological Goals: Control woody succession and continue efforts to reduce sericea lespedeza represent immediate and long-term goals. Both of these goals must be achieved to ensure the integrity of the prairie and its floristic diversity.

Environmental Threats: Threats include encroachment of woody vegetation; invasive exotic sericea lespedeza; Japanese honeysuckle, multiflora rose, Johnson grass, sweet clover, musk thistle and exotic cool-season grasses; recreational trail used for horseback riding, mountain bike, or off-road vehicles; browsing pressure from the large deer herd in the area.

Conservation Strategies:

- Control encroachment of native and non-native woody vegetation by cutting, burning and herbicide treatment. [pest management strategy] Periodic burns will stimulate prairie flora.
- Control sericea lespedeza infestation by annual herbicide applications. The triclopyr-based herbicide "PastureGard" is the most effective. PastureGard should be sprayed from late June through late August avoiding extreme drought conditions if possible. A concentration of .75 – 1% per gallon for spot-spraying is effective. [pest management strategy]
- Continue to work toward a well-maintained and defined hiking trail to facilitate greater visitation and enjoyment of the prairie resource by the public. The current trail system has issues with erosion on slopes. Additional funds should be sought to complete a north loop of the trail encompassing the remainder of the west-side prairie.
- Harvest seed from prairie forbs annually for use in restoration activities on the area.

Parks and Recreation does not have an integrated pest management plan to guide staff. A pest is any unwanted organism. An integrated pest management (IPM) plan provides a range of strategies that staff can apply to a specific site. Recommended integrated pest management practices aim to control pests through consideration of five different approaches: biological, cultural, physical, genetic, and chemical. An effective integrated pest management program should establish an organization's pest management policy, help identify pests correctly, monitor pest populations, determine action thresholds, choose proper management tactics or a combination of tactics, and evaluate the effectiveness of plans.

The department's designated natural areas' environmental plans incorporate elements of these five approaches to pest management, but do not have overall policy guidance from an integrated pest management plan. The department employs several pest management strategies in parkland outside of natural areas, but they are limited in their scope and tactics. For example, deer hunting is used to reduce over populated deer herds, considered pests, in park areas. Burning large areas, applying chemicals, and replanting strategies are used to remove some invasive species in parkland outside of designated natural areas, however, neither are integrated into a strategic approach.

Without an integrated pest management plan, pest management relies heavily on staff judgment and may be inconsistent. Strategies employed in isolation may benefit from additional combinations of tactics. Staff reported that many of their tactics are learned over time and that it would be beneficial to share these with other staff. Documenting and sharing this information would increase the department's ability to employ pest management strategies and protect the department from loss of institutional knowledge through employee attrition.

The department should use an incremental approach when developing environmental resource plans for parkland. We evaluated environmental plans from several other cities. The development of a system wide environmental resource plan takes time and requires continual upkeep. Portland, Oregon, Parks and Recreation, and Johnson County, Kansas, Parks and Recreation have environmental resource plans that develop a general approach for their park system based on park type and ecology. The plans identify broad strategies and provide examples of applications to specific parks. This broad approach is then applied systematically over time to develop more detailed plans for specific areas.

In the context of Kansas City, right-of-way upkeep, neighborhood parks, community parks, regional parks, greenbelts/trails, natural areas, and athletic fields are examples of various sizes and uses of parks. Developing approaches for the context of these park types may be a useful strategic approach in the creation of environmental resource plans.

Many city programs and partners focused on conservation and restoration of our local environment have developed resources applicable to the development of environmental resource plans for Kansas City parkland. Exhibit 3 contains only a portion of the resources we identified during our research. Incorporating partners' existing resources will help Parks and Recreation speed the creation of environmental resource plans.

Exhibit 3. Resources for Environmental Resource Planning

Organization	Types of Resources
Kansas City, MO, Parks and Recreation Department	Park Master Plans Urban Forestry Management Plan Roanoke Park Master Plan Past Reduced Mowing Program Urban Wood Utilization Plan
Kansas City, MO, Land Development Division, City Planning and Development	Riparian Tree Identification Field Guide
Missouri Department of Conservation	Defined Ecological Regions Integrated Pest Management Strategies Forestry Management Plans Urban Tree Guide Native Plant Restoration Material Seed Resources Plant Identification Field Guides
Mid-America Regional Council	Natural Resource Inventory of KC region Best Management Practices for Storm Water Management Regional Forestry Framework MetroGreen Framework
KC Wildlands/Bridging the Gap	Environmental Resource Plan Template Horticultural Practices Plant Lists for Ecology Types Seed Resources
KC Native Plant Initiative	Horticultural Practices Native Species Lists Seed Resources

Without environmental resource plans, the Parks and Recreation Department does not have a strategic approach to sustainable maintenance of park ecology. Developing and tracking the implementation of environmental resource plans provides continuity of strategies and more efficient implementation of resources to make park ecology more sustainable.

In order to guide staff's sustainable maintenance practices in parkland, the director of parks and recreation should incrementally develop environmental resource plans for parkland that utilize the existing work of the department, city programs, and area partners.

Sustainable Practices Need to Be Incorporated into Operations and Maintenance Manual and City Contracts

Parks and Recreation does not have written procedures for all sustainable practices to direct staff or contractors in parkland maintenance.

The Parks and Recreation Department needs to add written sustainable procedures. National Recreation and Park Association recommended practices state that written procedures and standards should incorporate sustainability. Adopted procedures should incorporate department goals and plans to address the sustainable maintenance of plant health, soil health, air quality, water conservation, and the removal of pests that interfere with natural ecologies. The Parks and Recreation Department's operations and maintenance manual contains procedures to guide staff related to maintenance of parks natural resources: mowing operations, chemical operations, turf maintenance policy, greenhouse and landscape operations, ozone action plan, and forestry management. It does not provide staff the direction necessary to implement sustainable practices outlined in recommended practices.

While the two Conservation Corps staff retain plant species lists, selections, and practices, these are informal and have not been incorporated into the department's operations and maintenance manual. In many cases, the Conservation Corps staff's sustainable practices were developed through trial and error or through the input of outside specialists such as KC Wildland, KC Native Plant Initiative, and the Missouri Department of Conservation. Because there are only two Conservation Corps staff and their sustainable practices are not part of the department's operations and maintenance manual, this information is at risk of being lost if either of those two staff left.

Pest management strategies identified in an environmental resource plan should have corresponding procedures described in the operations and maintenance manuals so they are consistently implemented. With the exception of chemical applications, the department does not have procedures for staff to follow in the implementation of integrated pest management techniques.

Without incorporating sustainability into the operations and maintenance manual, the department risks losing institutional knowledge when staff leave and staff who use sustainable practices may not have the authority to require others to implement those practices.

In order to reduce the risk of losing sustainable practices posed by employee turnover and to maximize the use of sustainable practices in everyday park maintenance activities, the director of parks and recreations should incorporate plant, air, water, soil, and pest management sustainable practices into the department's operations and maintenance manual.

Contracts for parkland maintenance do not always incorporate sustainable maintenance practices.
Recommended practices state that quality expectations for parkland maintenance should be clearly communicated to contractors. The Forestry Operations section includes clear requirements for contractors to comply with procedures for emerald ash borer pest management and adopted tree management techniques. Mowing and pruning contracts include requirements for contractors to abide by the city's ozone action plan. No other sustainable maintenance requirements related to plants, soil, water, or air quality are incorporated into park maintenance contracts. Without adopted sustainable maintenance requirements incorporated into parkland maintenance contracts, contract workers are not required to follow city sustainable maintenance practices.

In order to ensure contractors follow sustainable maintenance practices, the director of parks and recreation should incorporate the department's adopted sustainability requirements in parkland maintenance contracts.

Adopting Sustainable Maintenance Practices Requires Training

Department staff currently operate based on experience and institutional knowledge to guide maintenance operations in parks. Recommended practices for parks maintenance state that staff should receive ongoing training on adopted maintenance practices. Once sustainable maintenance practices are adopted, training will be necessary to help ensure staff have learned the new skills and follow practices.

To ensure staff have the necessary skills and are aware of the department's adopted sustainable maintenance practices, the director of parks and recreation should train staff on the department's adopted sustainable practices.

Recommendations

1. The director of parks and recreation should reduce mowing and replace turfgrasses with native plants when possible, shift flowerbeds to native or regionally appropriate perennial beds, and systematically plant and prune city trees.

2. The director of parks and recreation should adopt additional practices to limit the use of powered landscape maintenance equipment that exposes site users to local air pollutants and generates greenhouse gases.

3. The director of parks and recreation should adopt water conservation practices to track the amount of water applied annually for parkland maintenance and minimize the overall application of water for landscape irrigation after plant establishment periods.

4. The director of parks and recreation should develop additional practices to minimize or eliminate the use of synthetic pesticides in parks.

5. The director of parks and recreation should ensure staff adhere to the department's and city's adopted pesticide policies and procedures.

6. The director of parks and recreation should implement sustainable fertilizer observation and planning practices.

7. The director of parks and recreation should propose goals related to native plant selection, pest and invasive species management, air quality, soil inputs, and water conservation in parkland for consideration by the Board of Parks and Recreation Commissioners.

8. The director of parks and recreation should incrementally develop environmental resource plans for parkland that utilize the existing work of the department, city programs, and area partners.

9. The director of parks and recreations should incorporate plant, air, water, soil, and pest management sustainable practices into the department's operations and maintenance manual.

10. The director of parks and recreation should incorporate the department's adopted sustainability requirements in parkland maintenance contracts.

11. The director of parks and recreation should train staff on the department's adopted sustainable practices.

Appendix A

Director of Parks and Recreation's Response

Inter-Departmental Communication

RECEIVED
APR 20 2018
CITY AUDITOR'S OFFICE

DATE: April 20, 2018

TO: Doug Jones, City Auditor

FROM: Mark McHenry, Director, Parks and Recreation

SUBJECT: Preserve and Restore Park Ecology with Sustainable Maintenance Approach Audit

Attached is the response to the recommendations presented to Parks and Recreation as a result of the recent audit titled "Preserve and Restore Park Ecology with Sustainable Maintenance Approach". There is a tremendous amount of information on the topic. While we agree with all of the recommendations, some of the implementation and timing of the implementation will be contingent on the resources needed.

We agree there is value in the adoption of a Sustainability Plan and will be recommending a plan for Board approval in the next 6 months. While we have made progress on the implementation of environmental and sustainability practices in recent years through our work with partners such as Bridging the Gap, the Heartland Conservation Alliance, the Kansas City Native Plant Initiative, the Mid-America Regional Council and the Missouri Department of Natural Resources, we recognize the opportunities for improvement presented in the recommendations.

It will be imperative moving forward that the proper public education is done to minimize the risk of negative public perception. We are committed to continuing working with our partners, stakeholders and the community to strategically approach park maintenance through a lens of preserving park ecology.

1. **The director of parks and recreation should reduce mowing and replace turfgrasses with native plants when possible, shift flowerbeds to native or regionally appropriate perennial beds, and systematically plant and prune city trees.**

   Staff agrees with this recommendation

   Completed Actions

   - In 2011, staff reduced a total of 390 acres of mowing from the routine park mowing cycles. In 2015 that number was reduced to 260 acres due to complaints of the unsightliness of the areas considered "unmaintained".
   - In the fall of 2017 staff identified 24 parks with an estimated 200 acres of potential natural areas.
   - The Parks department has a "Street Tree Planting Requirement" posted online that provides information on what trees are recommended and the spacing requirement necessary for such tree plantings.
   - Parks staff applied for and received a Tree Resource Improvement and Maintenance (TRIM) grant from the Missouri Department of Conservation (MDC).
   - Parks and Recreation is a partner in the Kansas City Native Plant Initiative (KCNPI) and also sits on the Core Group Steering Committee and Nominating Committee.

   To Be Completed

   - With the TRIM grant mentioned above, the City is working with Bridging the Gap (BTG) and a Tree Champions Task Force appointed by the Mayor to create a Tree Master Plan. The master plan will be developed to improve the urban forest and increase our tree canopy. Meetings are currently in progress with a Tree Master Plan completion goal of 2019.
   - Expansion of existing sustainable plan practices will be included in the Sustainability Plan listed in recommendation #7.
   - A plant pallet and tree species list for native plants will be created and incorporated in the operations and maintenance manual, the park maintenance contracts, and as easily accessible tool for private citizens looking for guidance on sustainability practices.
   - In conjunction with MDC, a pilot project is currently being developed on 5 acres of Minor Park to implement a native plant area and reduce mowing. A plan will be developed within six months, with implementation beginning in spring of 2019.
     - *Significant Issue:* While staff currently possess the skills necessary to perform mowing and maintenance on open spaces, management of natural areas will require increased education on methods, plant identification, and site-specific details.
   - Currently Parks is in discussions with the KCNPI for design ideas to install sample beds utilizing more native plants to reduce the use of annuals while still meeting the aesthetic expectations of the community. These sample beds will be installed during summer of 2018.
   - Planting plans for "Pioneer Park" and the Paseo Bridge at Brush Creek are being designed with native perennial plants for current landscape improvements. Planting will occur by the fall 2018 planting season.
   - Over the past 5 years, forestry staff has pruned an average of 6,350 trees each year which addresses only 10% of the need. Tree pruning includes both reactive

responses to 3-1-1 calls and some very limited cyclic pruning. Ideally, trees should be pruned every 6-7 years, but with current resources, less than 1.5% of the urban forest is pruned each year.

- A decision package will be submitted for consideration by the City Council for additional resources to prune trees in accordance with ANSI A300 tree care industry standards.
    - *Significant Issue:* A similar decision package was submitted in prior years, but the funding was not available.
- The Park Maintenance and Forestry Divisions are implementing the use of Cartegraph maintenance management software. The Forestry division began using the software in 2017, and both divisions should have full implementation by fall of 2019. This software will allow for asset tracking of tree plantings in addition to scheduling pruning and park maintenance activities.
- A goal to transition 5% of current acreage mowed into natural areas in five years is recommended in the Sustainability Plan mentioned in #7 below.
    - *Significant Issue*: Transition of a greater number of acres would require additional funding for transition and assisted maintenance.
    - *Significant Issue*: For a significant transition to a true native area, the existing turf must be killed off, leaving the area bare for at least one season. Growing in a natural area will often require 3 years from starting on soil to a desirable area.

2. **The director of parks and recreation should adopt additional practices to limit the use of powered landscape maintenance equipment that exposes site users to local air pollutants and generates greenhouse gases.**

Staff agrees with this recommendation

Completed Actions:

- For the FY18 fleet replacement, Parks has purchased 24 propane powered mowers that will replace existing gas and diesel powered units. Propane is listed as a clean fuel by the U.S. Government energy policy makers and energy administrative bodies. It is not considered a greenhouse gas nor is it considered an air pollutant. These mowers are on order and will be used for the 2018 mowing season.
- For the FY18 fleet replacement, the Forestry Operations fleet has ordered two compressed natural gas (CNG) aerial trucks to replace two of the older diesel models. Because natural gas is a low-carbon, cleaner-burning fuel, a switch to natural gas in these applications can result in substantial reductions of hydrocarbon, carbon monoxide, oxides of nitrogen, and greenhouse gas emissions.

To Be Completed

- Research will begin during the summer of 2018 for options on handheld equipment such as blowers and string trimmers that use alternative power sources instead of gasoline. Staff will have this research completed within 6 months.
- Work that began in the summer of 2017 to begin "right sizing" the fleet by identifying trucks in the fleet that are viewed by Parks as oversized and not a direct need of routine park maintenance duties. Downsizing larger diesel trucks to smaller, more fuel-efficient trucks is being researched by Parks and Fleet. Implementation of "right sizing" will occur with truck purchasing beginning during the FY18 fleet replacement budget cycle.

- *Significant Issue*: Fleet has informed Parks staff that midsize trucks are not as feasible for CNG, and so unleaded vehicles are still being purchased at this time.
- *Significant Issue*: Parks is working with Public Works to maintain the right balance of large trucks needed for snow removal while still trying to achieve "right sizing".

3. **The director of parks and recreation should adopt water conservation practices to track the amount of water applied annually for parkland maintenance and minimize the overall application of water for landscape irrigation after plant establishment periods.**

   Staff agrees with the recommendation

   Completed Actions

   - A large percentage of the irrigation systems have been taken out of service in the last ten years.
   - During the summer of 2017, Parks staff began meeting with Water Services to discuss water usage and identify potential locations for water use reduction.

   To Be Completed

   - Staff is integrating native plants into its planting plans, which in time will reduce the need for excessive watering during dry periods.
   - As part of the proposed policy to be adopted by the Board of Parks and Recreation mentioned below in # 7, staff will recommend initiating practices to monitor water usage and develop a plan to reduce current usage by 20% in the next 2 years.
   - In the short term, water usage will be monitored this season by tracking the amount of water used on by the department's water tanks and trucks.
   - With the implementation of Cartegraph, plant establishment periods will be documented and monitored more closely.

4. **The director of parks and recreation should develop additional practices to minimize or eliminate the use of synthetic pesticides in parks.**

   Staff agrees to this recommendation.

   Completed Actions

   - Only non-restrictive herbicides are used for herbicide applications.
   - To control broadleaf weeds in some City parks, synthetic herbicide applications are made on a limited basis and on an average rotation of 3-5 years, if at all.

   To Be Completed

   - Create a sustainable pesticide use policy to minimize use of pesticide by taking into consideration the use of the area, least impactful thresholds and pesticide lists.
   - Document annual training of all maintenance staff on pesticide policies and procedures.

5. **The director of parks and recreation should ensure staff adhere to the department's and city's adopted pesticide policies and procedures.**

Staff agrees with this recommendation.

Completed Actions

- Staff assigned to pesticide applications attended certification through the State during the fall of 2017.

To Be Completed

- In 2018, pesticide safety items will be integrated into each district's weekly safety program.
- Additional staff will attend pesticide certification training in 2018.

6. **The director of parks and recreation should implement sustainable fertilizer observation and planning practices.**

Staff agrees with this recommendation

Completed Actions

- Fertilizers are applied on a limited basis at recommendations from the manufacturer. A large number of the Parks system plantings and landscape beds receive no fertilization.
- Contractors are required to provide certification if they use fertilizer.

To Be Completed

- Parks staff shall require maintenance contract services to maintain fertilizer and pesticide application logs to provide staff with accurate documentation of applications on Parks property.
- Implement as part of the Sustainability Plan in #7 fertilizer practices based on surrounding park ecology, soil composition and the needs of the plants.
    - Establish soil sampling protocols to reduce the use of pesticides with high nitrogen or phosphorous levels.
    - Determine fertilizer ratios based on need and not a pre-determined specification.

7. **The director of parks and recreation should propose goals related to native plant selection, pest and invasive species management, air quality, soil inputs, and water conservation in parkland for consideration by the Board of Parks and Recreation Commissioners.**

Staff agrees with this recommendation.

Completed Actions

- Over the past couple of years, Parks staff has attended training for invasive species management and identification through our partnership with KC Wildlands, MDC and the KCNPI.
- Staff has worked with KC Wildlands and numerous volunteer groups to remove invasive species (primarily honeysuckle) at a number of locations in the park system.
- Working with KC Wildlands, Parks and Recreation has continued to improve the quality of the largest remnant prairie in Jackson County at Jerry Smith Park.
- Additionally, the Glade in Swope Park continues to thrive from the department's efforts to alleviate invasive species through prescribed burns on an annual basis.

To Be Completed

- Staff will be recommending a Sustainability Plan to be adopted by the Board of Parks and Recreation Commissioners (Board) which will contain the following actions:
  - Clearly define "sustainability" for the department and establish measureable goals for water conservation, air quality, native plant conservation and preservation and soil management.
  - Incorporate Ecological Stewardship Goals in the next revision of the Parks Long Range Strategic and Business Plan.
  - Address the use of turfgrass and annual flowers in City parks
    - Reduce the total existing acreage mowed by 5% over the next 5 years.
      - *Significant Issue*: Commitment of funding and resource allocation will need to be provided to assist with implementation of these recommendations.
      - *Significant Issue*: For a significant transition to a true native area, the existing turf must be killed off, leaving the area bare for at least one season. Growing in a natural area will often require 3 years.
    - Reduce the existing use of annual flowers by 20% over the next 2 years.
    - Create and adopt design standards following National Park and Recreation Association (NRPA) best practices that will encourage native areas where applicable in newly developed parks and park improvement plans.
  - Continue efforts to reduce greenhouse gas emissions by following best practices and following the recommendations of the Ozone Action Plan.
  - Address water usage in park maintenance activities
    - Establish a baseline of current water usage and reduce by 10% in the next 3 years.
      - Evaluate the feasibility to increase use of storm water to irrigate turf grasses.
      - Monitor installation and establishment periods through maintenance management system (Cartegraph) to assure that once new plantings are established, routine watering is discontinued.
      - Install rain sensors on any remaining irrigation systems.
      - *Significant Issue*: During times of extreme stress or drought, supplemental watering may be required beyond the establishment period to sustain the lives of the trees, plants, or turf.
  - Address the use of pesticides in City parks
    - Create a sustainable pesticide use policy to minimize use by taking into consideration the use of the area, least impactful thresholds and pesticide lists.
    - Document annual training of all maintenance on pesticide policies and procedures.
    - Properly document adherence to the pesticide policy.
  - Address the use of fertilizers in City parks
    - Implement sustainable fertilizer practices based on surrounding park ecology, soil composition and the needs of the plants.

        - Establish soil sampling protocols to reduce the use of pesticides with high nitrogen or phosphorous levels.
        - Determine fertilizer ratios based on need and not a pre-determined specification.
    - Include sustainability goals annually in the department's Key Performance Indicators adopted by the Board and City Council through the budget approval process.
    - Develop environment resource planning (ERP) guidelines to be used for ecological succession.
        - *Significant Issue:* The creation of ERPs for all 221 parks is not feasible. However, establishing a template to use for developing these ERPs and establishing priorities for which plans to write first will be part of these guidelines.
    - Incorporate plant, air, water, soil, and pest management sustainable practices into the department's operations and maintenance manual.
    - Establish training frequency of Sustainability Plan for park maintenance staff.

8. **The director of parks and recreation should incrementally develop environmental resource plans for parkland that utilize the existing work of the department, city programs, and area partners.**

   Staff agrees with this recommendation:

   Completed Actions
   - Parks works with KC Wildlands to identify environmentally-sensitive areas within the parks, and to develop plans to preserve those areas.
       - *Significant Issue*: The ability to provide staff for work with partners may be limited with current funding. Funding for new programs will need to be identified.

   To Be Completed
   - As mentioned above, Parks staff is working with Bridging the Gap to create a Master Tree Plan with the implementation of the Tree Champions group. This master plan includes the development of a citywide plan for the planting and maintenance trees in the City. Meetings are currently in progress with a completion goal of fall 2019.
   - Parks will establish environmental resource planning (ERP) guidelines to be used for ecological succession.
   - *Significant Issue*: The creation of ERPs for all 221 parks will need to be incremental. However, establishing a template to use for developing these ERPs and establishing priorities for which plans to create first will be part of these guidelines.

9. **The director of parks and recreations should incorporate plant, air, water, soil, and pest management sustainable practices into the department's operations and maintenance manual.**

   Staff agrees with this recommendation

   Completed Actions
   - Staff works with many partners including, but not limited to, the Missouri Department of Conservation, the Heartland Conservation Alliance, KCNPI, the Mid-America

Regional Council, and Bridging the Gap to implement sustainability practices and trends.

To Be Completed

- Once the Board adopts the Sustainability Plan listed above in #7, the goals and practices will be incorporated into the department's operations and maintenance manual.
- Park maintenance staff will be trained annually on this policy.

10. **The director of parks and recreation should incorporate the department's adopted sustainability requirements in parkland maintenance contracts.**

Staff agrees with this recommendation

To Be Completed

- Once the Board adopts the Sustainability Plan listed above in #7, the goals and practices will be incorporated into the department's park maintenance contracts.

11. **The director of parks and recreation should train staff on the department's adopted sustainable practices.**

Staff agrees with the recommendation

To Be Completed

- Staff will review and update the department's Sustainability Plan as approved by the Board on #7 in accordance with the CAPRA Accreditation requirements for review of all policies and procedures.
- Staff will establish a training program for the department's Sustainability Plan as approved by the Board on #7 above.
- Staff will incorporate information on sustainable practices into the onboarding process.